USAWC STRATEGY RESEARCH PROJECT

NUCLEAR DETERRENCE IS HERE TO STAY

by

CDR JOHN J. WELSH
UNITED STATES NAVY

CAPT. ROBERT BARNES
Project Advisor

U.S. Army War College
CARLISLE BARRACKS, PENNSYLVANIA 17013

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ABSTRACT

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In the most recent National Security Strategy President Bush has stated that deterrence doesn't work. The latest Nuclear Posture Review, completed in December 2001, proposed the tenets of Nuclear Deterrence to be: downsize the nuclear force level to 1700 – 2200 weapons, develop smaller yield weapons, and preempt if necessary. Additionally, President Bush supports developing a national missile defense system to protect the U.S. homeland. In my paper, I will offer the thesis that nuclear deterrence has kept us from going to major war with a peer since the inception of nuclear weapons, and is still vital to our national security. Additionally, I will argue that a national missile defense system may enhance our security against rogue states, but can not replace nuclear weapons; that terrorist and non-state actors can be deterred through deterrence by denial; that we should develop smaller yield nuclear weapons (despite large infrastructure concerns), and that we should NOT reduce the size of our nuclear arsenal to that of a minor nuclear power.

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"The United States will continue to make clear that it reserves the right to respond with overwhelming force—including through resort to all our options—to the use of WMD against the United States, our forces abroad, and friends and allies."

-President George W. Bush 2002 [1]

This strong statement comes as United Nations inspectors enforce Resolution 1441, searching for Weapons of Mass Destruction (WMDs) in Iraq, and as U.S. forces conduct flexible deterrent options (FDOs) in the area around Iraq. The above statement, however, seems to fly in the face of what President George W. Bush stated in the most recent National Security Strategy (NSS) - deterrence doesn't work against rogue states or terrorists.[2] As the prelude to Desert Storm, President George H. W. Bush made a similar statement, which many believe prevented Saddam Hussein from using WMDs against coalition forces. The implication by the statement is simple- if you use a WMD (whether it be chemical, biological, or nuclear), we will retaliate with nuclear weapons. This is nuclear deterrence at its finest.

Nuclear weapons were a significant factor for the USSR and the USA in their relations following the Second World War. The USSR set as its goal the establishment of military and political hegemony, and control over the development of civilization. Two different military and political blocks were constructed that exerted influence for many years on dozens of countries and billions of people. Nuclear weapons emerged as the physical manifestation of the massive military might of the two superpowers, and forced the USSR and the USA to assume guarded approaches during any crisis to prevent the possibility of direct conflict. The antagonism of the standoff made inevitable quests for new ways of achieving decisive military superiority, and made resistance to such efforts equally inevitable. For both sides, nuclear weapons were the material guarantee of security, and a source of permanent concern regarding any possibility that the enemy could destroy such weaponry.[3]

The latest Nuclear Posture Review, completed in December 2001, proposed the tenets of nuclear deterrence to be: downsize the nuclear force level to 1700 – 2200 weapons, develop smaller yield weapons, and preempt if necessary. Additionally, President Bush supported developing a national missile defense system to protect the homeland. In my paper, I will argue that nuclear deterrence has kept us from a major war with a peer since the inception of nuclear weapons, and is still vital to our national security. Additionally, deterrence has in the past, and will continue in the future, to prevent rogue states or terrorist organizations from using a nuclear device against the United States. Additionally, I will argue that a national missile defense system can not replace nuclear weapons in our national security, that we should scrap it and replace it with robust and effective theater missile defenses, that we should develop smaller yield nuclear weapons (despite large infrastructure concerns), and that we should NOT reduce the size of our arsenal to that of a minor nuclear power.

WHAT DETERRENCE IS AND WHAT IT IS NOT (DETERRENCE THEORY)

Entire texts have been devoted to the theory of deterrence, but what I will present below will serve as a quick overview of deterrence.

Deterrence is a complex concept. The word deter derives from a Latin root, *deterre*, that means "to frighten from" or "to turn aside, discourage, or prevent from acting." A more modern definition comes from Webster's dictionary which defines deterrence as: "The act or a means of deterring and measures taken by a state or an alliance of states to prevent hostile action by another state."[4] Deterrence is actually a communication process with elements of punishment and assurance. An adversary must believe that certain actions will result in unacceptable risks and losses and, conversely, that averting those actions will prevent the execution of the threats. The process of deterrence involves assessing both what is known and what is not. Capabilities to punish can be measured with good knowledge, but intentions and willingness to act or show constraint can not.[5] Can we make the assumption that the fear of punishment kept us from going to war with the Soviets during the Cold War? Many believe that nuclear deterrence was in fact a major factor. When we look at the Cold War in retrospect, we find that we experienced the longest peace among major powers in the history of the world.[6] It is hard to *prove* that the concept of deterrence alone kept the U.S. and the Soviet Union from using nuclear weapons, but the evidence points to the fact that since their introduction, nuclear weapons and their *threat of use* have kept us from going the route of the dinosaurs by destroying the Earth and the exterminating the entire human race.

ELEMENTS OF DETERRENCE

For deterrence to be successful, I believe that several conditions must be met:

- The threat must be credible. Deterrence without credibility is only a threat backed up by a lie.
- Both parties must "agree" to be deterred. In other words if an adversary doesn't care about the potential cost of his action, he will not be deterred. The argument about terrorists not being deterred fall into this category (and will be discussed later).
- The cost- benefit calculus must be such that the potential benefit of an action far outweighs the consequence of that action.
- Things can not deter. Actions (or the credible threat of action) can. Availability of nuclear weapons may or may not deter an action, but the threat of their use will.
- Targets, groups of targets, or targeting strategies should be communicated clearly from the outset. By knowing what will be destroyed, an adversary will be more likely to weigh the potential consequences of his actions.
- One or more centers of gravity must be held at bay. This may seem obvious- could we deter a nation by saying we will launch nuclear weapons against an unpopulated area to show that we can reach out and touch them? Of course not- this would serve no useful purpose.

FORMS OF DETERRENCE

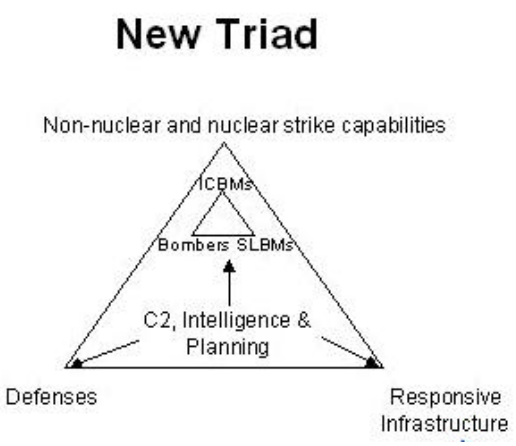
There are two major forms of deterrence- deterrence by punishment and punishment by denial. [7]

Deterrence by punishment is what I would classify as an offensive measure and is classically thought of as Cold War deterrence. In its simplest form it states: If you do 'X', I'll do 'Y'. The idea is that the adversary weighs the cost and benefits of his actions, and if the cost is greater than the benefits, then the action will not be undertaken. One point must be stressed- the threat of action must be credible- the adversary must believe that the stated action will be

taken. Deterrence by punishment led to the theory of Mutually Assured Destruction (MAD) I believe that MAD was the reason why the U.S. and the Soviet Union developed, tested, fielded, and postured against each other using nuclear weapons but did not attack each other as so many other superpowers have done in the past.

Deterrence by denial is what I would classify as a defensive measure and refers to the ability to remove one or more center(s) of gravity of an adversary by holding them risk.[8] An example of deterrence by denial could be the use of a missile defense system to prevent warheads from reaching American soil, or by preventing the attainment of nuclear weapons by an adversary. In these two examples, an adversary's center(s) of gravity are being threatened, and consequently deter an attack.

Transformation of US Nuclear Deterrence



THE NEW TRIAD

Over the past 50 or so years the U.S. has relied on deterrence by punishment (specifically mutually assured destruction of the Soviet Union) by using a triad consisting of Ballistic Missile Submarines (SSBNs), manned bombers, and Intercontinental Ballistic Missiles (ICBM's). This theory of deterrence worked well in the bi-polar world which existed during the Cold War, and provided stability between the two super powers. Since the collapse of the Soviet Union in the early 1990's, the world changed dramatically. Today's world has the U.S. as the only remaining super power. The main threat is no longer from the Soviet Union, but instead, is from many different nation states and non-state actors. As a result of the transformation of the world stage, the triad which had served us well during the Cold War required transformation as well. As seen in the Figure, the traditional Cold War triad is now a smaller subset of the current triad and is incorporated with non-nuclear capabilities[9]. I believe that the reason for the new Triad is a fundamental shift from a threat based to a capability based strategy and the fact that deterrence

may be successful through the non-nuclear option of massive conventional firepower, as we have seen in every other conflict to date. In addition to the purely offensive nature (deterrence by punishment) the new Triad also incorporates deterrence by denial in the “Defenses” and “Responsive Infrastructure” portion. Command and Control (C2), Intelligence and Planning provide the glue to hold all three corners of the triad together. I will talk more about the defenses portion of the triad later in the paper, but I believe that the “Responsive Infrastructure” and “C2, Intelligence, and Planning” piece have remained the same (even though it was not depicted in the Cold War version of the triad).

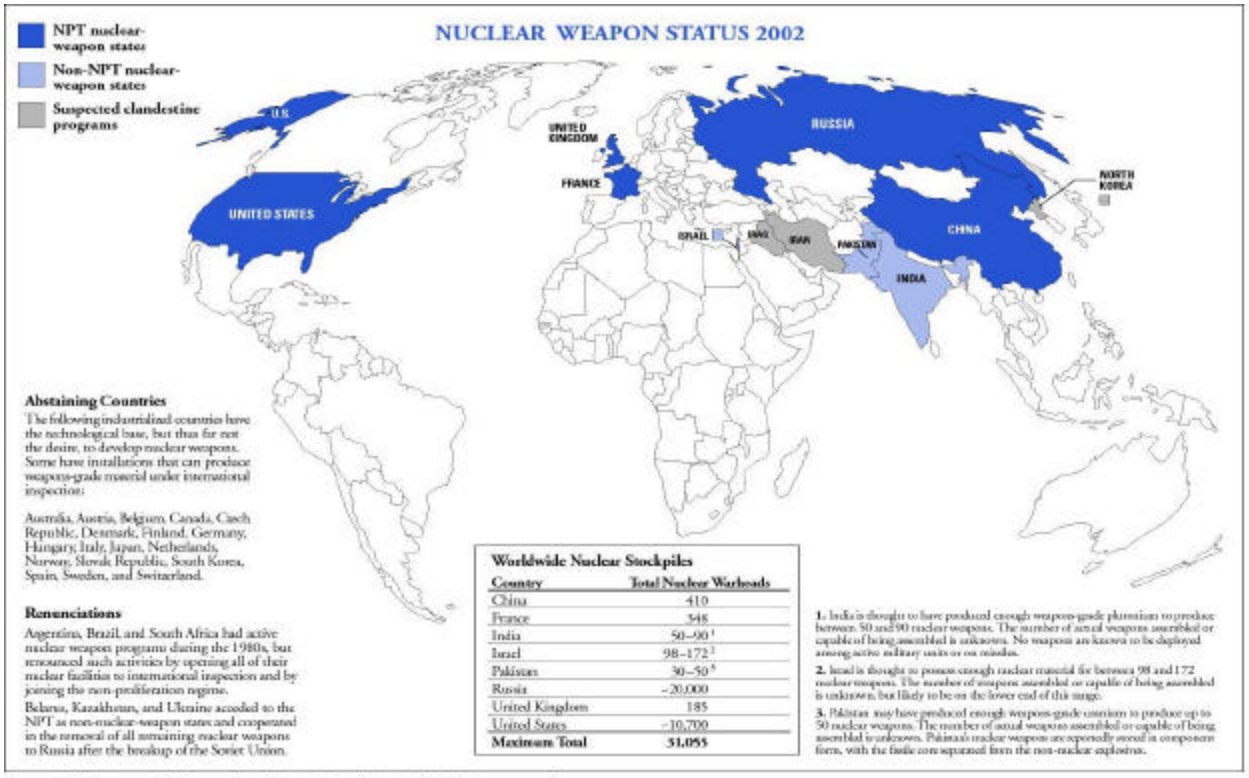
WORLD NUCLEAR INVENTORIES

THE CURRENT PLAYING FIELD.

> **“The United States will enhance its strategic nuclear deterrent by developing the capability to sustain protracted nuclear conflict in accordance with the guidance provided in NSDD-12, NSDD-13, NSDD-26, PD-53, and PD-58.”**
>
> — President Ronald Reagan, 1982 [10]

> **“We dare not tempt them with weakness. For only when our arms are sufficient beyond doubt can we be certain beyond doubt that they will never be used. But neither can two great and powerful groups of nations take comfort from our present course--both sides overburdened by the cost of modern weapons, both rightly alarmed by the steady spread of the deadly atom, yet both racing to alter that uncertain balance of terror that stays the hand of mankind's final war.”.**
>
> — President John F. Kennedy, 1961 [11]

Both quotes, taken decades apart, state that we will continue to have nuclear weapons as long as there are enemies of the U.S. and nuclear weapons. Since the first nuclear weapon use, eight countries have developed and fielded nuclear weapons to enhance their security. The figure below depicts the makeup of the playing field.[12] Russia and the United States



Carnegie Endowment for International Peace, *Deadly Arsenals* (2002), **www.ceip.org**

CURRENT NUCLEAR WEAPONS STATUS- 2002

clearly dominate. Their arsenals were rapidly built up in the Cold War arms race with the sole purpose of ensuring Mutually Assured Destruction (MAD). India and Pakistan developed weapons to deter each other in the on-going conflict in Kashmir. China's arsenal is designed in part to deter the U.S. from interfering with the reunification of Taiwan and in part to ensure its survivability. China is currently developing a new Ballistic Missile Submarine (SSBN) and missile system.[13] Israel possess a small arsenal mostly based at sea on submarines and nuclear capable F-15's and 16's and is designed to provide stability in the region and deter against an attack from a regional hegemon. [14] France and the United Kingdom's arsenals are sized to provide European stability, deter against an attack of their countries, and provide NATO with indigenously located weapons on the European continent. It is interesting to note that in

the 1980's several countries had active nuclear weapons programs, and gave them up due primarily because of their large price tags and the fact that they believed that the U.S. would provide a nuclear umbrella over them. Additionally, it is suspected that several other countries have started work on the development and/or the fielding of nuclear weapons. These countries include the so-called "axis of evil" (Iran, Iraq, and North Korea) along with Libya. Only North Korea has publicly admitted (and then retracted the statement, and then readmitted) to actually possessing nuclear weapons. From myriad often conflicting reports, it is not clear whether or not nuclear weapons are in North Korea's arsenal. In my view, the aim of North Korea's nuclear weapons development is to provide a strategic hedge, to allow reunification of North and South Korea to continue, and perhaps more importantly, to use them as a means to have economic sanctions them lifted. The revelation of North Korea's weapons program is causing serious concerns about the stability on the Korean peninsula, and the outcome of this will not be known for some time to come. Libya, Iraq, and Iran are suspected of developing nuclear weapons for much the same reasons as India and Pakistan- to deter each other, provide weapons of last resort if conditions would warrant, and to use as a bargaining chip to ease sanctions.

Clearly, despite the Non Proliferation and Comprehensive Test Ban Treaties, proliferation of materials and knowledge required to build and field nuclear weapons will continue and perhaps even increase in the foreseeable future. Based on the strategic and political uncertainties, it seems essential for the United States to maintain nuclear weapons and maintain a strong deterrence posture for a long time to come.

REASONS FOR POSSESSING NUCLEAR WEAPONS (FROM THE DECLARED WEAPONS STATES PERSPECTIVES)

> **The Government wishes to see a safer world in which there is no place for nuclear weapons. To help make the world a safer place the Government is pressing for multilateral negotiations towards mutual, balanced and verifiable reductions in nuclear weapons, but of course we are not there yet. That is why we need to maintain our nuclear deterrent as the ultimate guarantee of our security".**
>
> ¾ **Rt. Hon. Geoffrey Hoon MP, British Minister of Defense, 2002** [15]

It is interesting to note that the countries currently possessing nuclear weapons are not calling for an end to nuclear weapons or nuclear deterrence. Common beliefs among them are:

- They provide a big capability at a small price. They are significantly cheaper than a conventional military force that provides the same deterrent.
- Nuclear weapons will continue to be proliferated by regional powers at an increasing rate in the future.
- More threats will emerge and the power relationships internal to nations and between nations are never static, and the future is unknown. Nuclear weapons and deterrence provide a hedge against unexpected events.[16]

Former British Prime Minister Major summed up the views on nuclear deterrence by stating "Nuclear deterrence has preserved security and stability over the past half-century. Until security can be assured by other means, and the threat of proliferation removed, it is essential to maintain effective nuclear deterrence. The existing nuclear powers should take the decisions necessary to achieve this." [17]

US NUCLEAR INVENTORY

NUMBERS MATTER (OPTIONS TO ARSENAL LEVELS)

To find how U.S. nuclear deterrence will be handled, one must look at the Nuclear Posture Review completed in December 2001, which marks a radical point of departure from previous policies of nuclear deterrence. Strangely, specific wording that had historically been found in the National Security Strategy describing the United States' nuclear deterrence policy was missing in the most recent revision.[18] Additionally, there are indications that the nuclear deterrent wording will be absent from the Bush Administration's National Military Strategy, expected in early 2003.

The latest arms limitation treaty, the Strategic Offensive Reduction Treaty (SORT) agreement calls for a reduction of the nuclear arsenal to 1700-2200 deployed warheads (down from **over** 6000). [19]

This section will explore the correct sizing of the nuclear forces in the future and review three options that were examined in the most recent QDR- complete abolishment of nuclear weapons, maintaining the currently stated force structure, and finally, maintaining a very small number of warheads (300-500).

OPTION 1: COMPLETE NUCLEAR WEAPON ABOLITION

The first option is the complete abolition of nuclear weapons throughout the world. Certainly the most altruistic option, and in the minds of many people, this is the only moral option. This policy has been espoused by national and international religious organizations[20], former governmental leaders[21], former military members[22], and several Non-Governmental Organizations (NGO's)[23]. Additionally, Article VI of the Non-Proliferation Treaty (which the United States, Russia, and China are signatories) specifies that "Each of the Parties to the Treaty undertakes to pursue negotiations in good faith on effective measures relating to cessation of the nuclear arms race at an early date and to nuclear disarmament, and on a treaty on general and complete disarmament under strict and effective international control."[24]

There are many arguments to support a world that is free of nuclear weapons. Among these are: nuclear weapons are not really weapons at all, but instruments of mass annihilation, of genocide, and possibly of omnicide; nuclear weapons are inhumane and undermine our humanity by their very existence; they are city destroying weapons that target the innocent, killing and maiming indiscriminately[25]. Additionally in 1996, the International Court of Justice ruled that "that the threat or use of nuclear weapons would generally be contrary to the rules of international law applicable in armed conflict, and in particular the principles and rules of humanitarian law" [26]

Despite the arguments for the abolition of nuclear weapons, there are several compelling reasons against this:

First is the cost of physically destroying all nuclear weapons in a rapid manner. In today's fiscally constrained environment, it would be prohibitively more expensive to destroy these weapons than to maintain them. In addition to the cost, there is a related issue which is a loss of technical experience and the corresponding infrastructure to destroy them in a reasonable time. The strategic infrastructure personnel base is shrinking due to high retirement rates of senior personnel, inability to recruit junior personnel, and the attractiveness of private-sector employment. The bottom line is that without skilled, knowledgeable individuals in the infrastructure, the destruction of weapons will take a prolonged time, accompanied by a hefty price tag. [27]

Second, a worldwide binding resolution would have to be agreed on by every nation who possesses or aspires to possess nuclear weapons to destroy them simultaneously, so as

prevent a power shift in global powers due to differing rates of the complete nuclear draw down. Despite the Non Proliferation and Comprehensive Test Ban Treaties being in existence, both Pakistan and India developed and tested nuclear weapons (neither one are signatories to either treaty). Also, it is clear based on recent terror attacks, that terrorists are only concerned with the furthering of their ideals and do not and will not abide by any resolution by any governing body whatsoever. Even the most effective verification system that can be envisioned would not produce complete confidence that a small number of nuclear weapons had not been hidden or fabricated in secret. More fundamentally, the knowledge of how to build nuclear weapons cannot be erased from the human mind. Even if every nuclear warhead were destroyed, the current nuclear weapons states, and a growing number of other technologically advanced states, would be able to build nuclear weapons within a few months or few years of a national decision to do so. [28]

The third reason against the total abolition of nuclear weapons is, despite a new sense of friendship and cooperation between the Cold War rivals, the democratization of Russia is still in its early stages, with indications of high internal tensions. Consequently, if Communist hardliners were to affect a coup and restore the former Communist party to power, the U.S. would once again present a threat to the Russian Communist norms and ideals. Additionally, "It is not now obvious, for example, whether Russia, China, or some combination thereof will be politically benign or quite hostile even in the near future. Looking out over the coming decades, it is quite plausible that a variety of other regional aggressors armed with weapons of mass destruction (WMD) could arise to challenge the United States. The dizzying pace of change in the international system over the past two decades, from the rapid transition of Iran from ally to foe, to the significant shifts in U.S.-Russian and U.S.-Chinese relations since the 1980s, demonstrates that the future shape of the international security environment is anything but highly predictable. Similarly, the current pace of proliferation makes predictions about the future level of WMD threat to the United States highly speculative." [29]

Finally, the nuclear era represents the longest period without war among major powers since the emergence of the modern nation state in the sixteenth century. Thus, it is argued that, if the major powers believed the risk of nuclear war had been eliminated, they might initiate or intensify conflicts that might otherwise have been avoided or limited. [30]

In conclusion, despite the global peace which so many groups declare as being possible only through the complete abolition and destruction of nuclear weapons, the problematic issues

described above are in my opinion valid reasons for maintaining a nuclear arsenal for the United States' and for our allies' security. Based on the above arguments, a world with no nuclear weapons could be a far dangerous and less secure place for the U.S. than a world full of them.

OPTION 2: MAINTAIN CURRENTLY STATED FORCE STRUCTURE

The current plan is to maintain a force of reduce *operationally deployed warheads* to 3800 by FY 07, with a goal of 1700-2200 by 2012.[31] These levels were codified in the Moscow Treaty signed by Russian President Putin and U.S. President Bush in May 2002. Many people have called for an end to Cold War thinking about nuclear weapons and nuclear targeting, and the currently stated policy is seen as a step in the right direction. As a result of the end of the Cold War "the U.S. will no longer plan, size, or sustain its forces as though Russia presented merely a smaller version of the threat posed by the …Soviet Union".[32] 1700 – 2200 nuclear warheads would provide adequate numbers to counter a future Communist resurgence in Russia, Chinese nuclear weapons and delivery vehicle proliferation, and an increased rogue nation threat based on the best estimates of global security in 2020. In general, targeting priorities are for Nuclear, Biological, and Chemical weapons (NBC) counterforce, WMD production and storage facilities, power projection bases, economic targets, and leadership targets for rogue nations. There is no deliberate targeting of cities against any adversary.[33]

As was stated above SORT is the instrument that codifies the 1700 -2200 levels, but "the only legally binding commitment the United States and Russia undertake under the terms of the agreement is to deploy no more than 1,700 to 2,200 warheads on 'operationally deployed' launchers by December 31 ,2012."[34] The key here is *operationally* deployed warheads. Directly undermining Bush's claim that it liquidates the Cold War's legacy, the treaty is silent on what happens to the weapons to be retired. They can be stored, put in reserve or dismantled.[35] This treaty and policy has been seen as a step in the right direction, but many believe that to "liquidate the Cold War legacy", the weapons that are removed from the inventory could be removed much more quickly than delineated in SORT, and they should be destroyed vice placed in reserve.

One other issue is the development of new weapons of lower yield that may make their use "thinkable". The argument is that with the current inventory of conventional weapons, it is not possible to destroy the types of targets we are likely to be confronted with in the future- namely the deeply buried and hardened underground targets. Today's generations of nuclear weapons

are left over from the Cold War- they are all “city busters”, and their collateral damage would be immense. Additionally, there is only one warhead type (a high yield warhead) in the inventory capable of sufficient earth penetration to destroy these targets. There are several problems with the development of new weapons. Among these are: that it could spark a new arms race (China has already stated that if the U.S. develops new weapons, it would have no choice but to do the same)[36]; that the nuclear weapons infrastructure is not robust enough to develop these weapons; and that the United States’ declared policy that it will not test nuclear weapons (despite refusing to sign the Comprehensive Test Ban Treaty). Developing new nuclear weapons has also drawn criticism that this will not end the Cold War legacy, and in the eyes of three former Nobel Peace Prize winners, “Developing ‘useable’ nuclear weapons with perceived military value will encourage other states to pursue similar capabilities. Moreover, even with use of ‘small’ nuclear weapons, this will invite other states to retaliate against the U.S. with larger and more devastating nuclear, chemical, or biological weapons.”[37]

OPTION 3: MAINTAIN ONLY A VERY SMALL NUCLEAR FORCE

In an attempt to bridge the gap between our current level of nuclear weapons and total abolition, several groups[38] have advocated that the force size should be the minimum number possible- perhaps on the order of 300 to 500 (examined during the last QDR.)[39]

A recent study by the Brookings Policy Institute has suggested that the correct size of nuclear weapons held by both the United States and Russia should be well below 1,000 weapons each.[40] These weapons “deployed in highly survivable basing modes such as aboard submarines would be sufficient to meet even the most demanding deterrence contingency. And truly deep cuts in strategic offensive forces would ease Moscow’s fears that an eventual U.S. missile defense is aimed at Russia, thereby making it more likely that it would reciprocate, further reducing the number of missiles aimed at the American people.”[41]

There are benefits of a very small force, namely it would be easier to ensure the safety and security of these weapons, and the money saved by maintaining lower numbers could be reinvested in other defense programs. There are issues associated with a minimal strategic nuclear force including:

First would be “invidious comparison”.[42] If there was a treaty that stated that all nuclear forces be drawn down by 90% (to get the United States and Russia to a level of 300 to 500), the smaller nuclear powers would feel that they are already at finite, minimal levels, and “it would be

outrageous to ask one of them to reduce their arsenal by 90%...."[43] This could lead to a case where a nuclear power does not reduce its arsenal at the same percentages and could cause their arsenals to be at parity with the United States and Russia, thus sparking another arms race. In this situation we can expect a great many Americans and the Congressmen that represent them, to be leery of any arrangement where the PRC negotiates a nuclear arsenal equal in size to that of the United States.[44]

The second reason against maintaining only a very low level of nuclear weapons involves morality of the use of such weapons. At these very low levels, the problems of crisis stability would be heightened where their use might be used in a 'use it or lose it' mentality. Its target would undoubtedly be against a major civilian population center- "the reminder that cities would assuredly be destroyed. Low numbers thus are likely to make clear the morally ugly nature of nuclear deterrence, when higher numbers have made it possible to blur the ugliness".[45]

The final argument is that at such a low number the United States' nuclear weapons would be in jeopardy of a crippling preemptive attack by a nation who is at nuclear weapons parity.[46] The attack could conceivably be accomplished using nuclear or conventional weapons. A scenario where this could occur would be if the nuclear forces are drawn down and concentrated in the most survivable leg of the triad, the ballistic missile submarine force. At any one time, several submarines are concentrated in their home ports undergoing refit, and maintenance. A well-trained, well-organized military, paramilitary, or terrorist group could stage simultaneous or near simultaneous attacks and destroy or cripple all ballistic submarines not at sea. In just one day, a large portion of the U.S. nuclear arsenal could be wiped out, and leave nuclear weapons that number the same as a minor nuclear nation.

TACTICAL NUCLEAR WEAPONS

The Washington Naval Treaty, signed after World War I, was constructed to "contribute to the maintenance of the general peace, and to reduce the burdens of competition in armament" by limiting the numbers, types, and displacement of naval vessels.[47] Missing from the treaty were submarines and aircraft carriers, and had loopholes which allowed countries as Germany and Japan to build their naval fleets into massive armadas, while still maintaining the letter of the law of the treaty. The situation with tactical nuclear weapons and the arms control treaties today is analogous to the Washington Naval Treaty.

Tactical (nonstrategic) nuclear weapons (TNWs) typically refer to short-range weapons; within the U.S.-Soviet (Russian) context, this means land-based missiles with a range of less than 500 km (about 300 miles) and air- and sea-launched weapons with a range of less than 600 km (about 400 miles). However, these definitions are not universally accepted. France classifies all its currently deployed nuclear weapons as strategic. China also classifies many weapons as strategic, that in the U.S.-Russian context would be considered tactical.[48] Tactical weapons make up almost half of the Russian and U.S. arsenal, and are the least well regulated.[49] The only agreement about TNW numbers came when then President George H. W. Bush announced on September 27, 1991, that the U.S. would eliminate its entire worldwide inventory of ground-launched TNWs and would remove all nuclear weapons from surface ships and attack submarines, and remove all US nuclear weapons from Europe.[50] Mikhail Gorbachev would have preferred to have a treaty to cover TNW's, but accepted the announcement and agreed to similar reductions, with a timeline for completion of 2004. Despite the agreement final destruction of the weapons was not covered, and as a result, many of these weapons remain in storage in the U.S. and Russian arsenals. Several dangerous and destabilizing issues remain associated with tactical nuclear weapons:

- The sheer numbers in the inventories of almost all nuclear nations make them expensive to maintain, and make them more likely to be "misplaced" due to accounting errors.
- Since these weapons were designed to be used on a tactical battlefield, command and control, specifically launch authority becomes an issue. Since they are forward based, this can make the decision to use TNWs psychologically and operationally easier.
- Military thinking argues for the pre-delegation of launch authority to lower-level commanders, especially once hostilities commence, because of a concern about TNW survivability. This might result in diminished control over TNWs by the political leadership.
- Low-yield TNWs are sometimes seen as less destructive and thus more usable than other classes of nuclear weapons. This might increase the probability of limited use of nuclear weapons and is the reason for increasingly vocal demands in the United States and Russia for the creation of low-yield nuclear weapons.

- Due to their small size, and lack of an electronic lock or Permissive Action Link (PAL) on older weapons, an increased risk of an accidental or unauthorized launch may be realized.[51]

Due to the myriad problems and potential dangers described above, a small number (perhaps on the order of 200 – 300) should be modified for use against hardened and deeply buried targets which will fill a need that is lacking in the current U.S. inventory of nuclear weapons. The latest NPR states "The United States currently has a very limited ground penetration capability with its only earth penetrating nuclear weapon, the B61 Mod 11 gravity bomb. This single-yield, non-precision weapon cannot survive penetration into many types of terrain in which hardened underground facilities are located. Given these limitations, the targeting of a number of hardened, underground facilities is limited to an attack against surface features, which does not does not provide a high probability of defeat of these important targets."[52] The remainder of the TNWs should be transparently demilitarized, with the highly enriched uranium (HEU)and/or plutonium converted into low enriched nuclear fuel to be used in civilian nuclear power plants. Performing the demilitarization transparently would show the world that the U.S. is committed to a reduction of its nuclear arsenal and convince others to do the same.

ARSENAL SIZE CONCLUSION

I believe that the U.S. should continue the draw down to 1700 – 2200 weapons, develop 200 – 300 new smaller yield weapons using the current excess TNWs, and maintain a number of weapons as a hedge against future breakout and as a reserve capability. This recommendation is based on the fact that I believe that we will never be able to get rid of all nuclear weapons, as many small countries see them as the ultimate bargaining chip and means for regional security and national sovereignty. Further reducing the nuclear arsenal to a very small number may actually cause nations to aspire to be regional or even global hegemons, through threats of nuclear weapons use on their neighbors, with the U.S. unable to provide sufficient deterrence through insufficient nuclear weapons numbers.

NUCLEAR DETERRENCE AND MISSILE DEFENSE

> **"No treaty that prevents us from addressing today's threats, that prohibits us from pursuing promising technology to defend ourselves, our friends and our allies is in our interests or in the interest of world peace. When ready, and working with Congress, we will deploy missile defenses to strengthen global security and stability. We should leave behind the constraints of the ABM Treaty that perpetuates a relationship based on distrust and mutual vulnerability"**
>
> ¾ **President George W. Bush, 2001**[53]

MISSILE DEFENSE HISTORICAL OVERVIEW

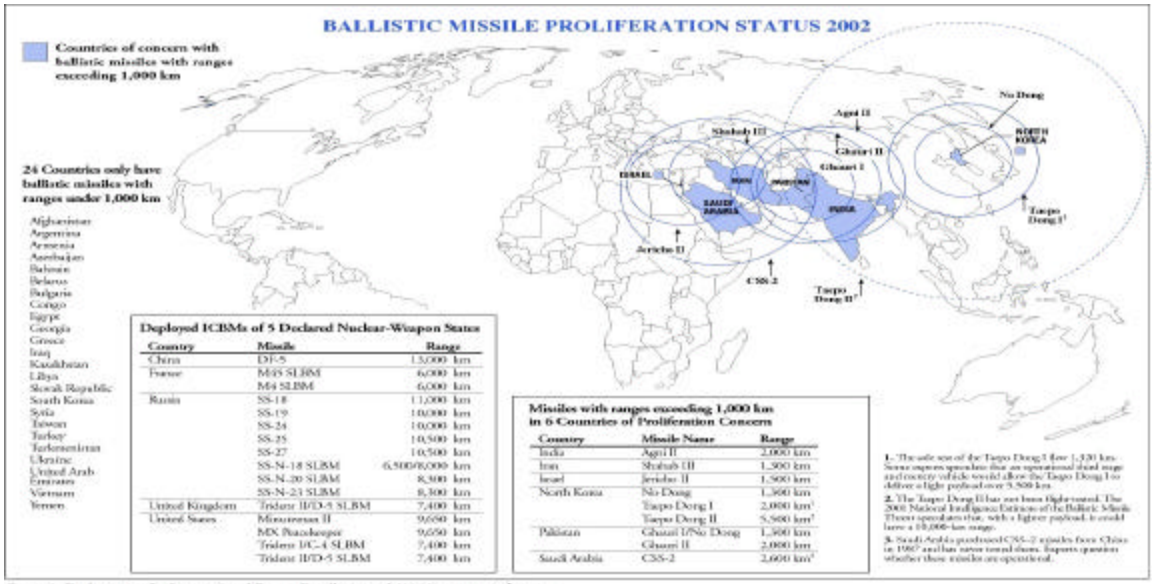
The debate on national missile defense has been around at least since the early 1980's when President Reagan announced that he supported the Strategic Defense Initiative, one part of which would be the interception and destruction of incoming ballistic missiles and their warheads using land and space based systems. The Strategic Defense Initiative and national missile defense seemed to die with the end of Reagan's presidency due to the high price tag, the lack of a deliverable, and pressure from Congress to use the money for other social programs. The issue once again came to the forefront during the Gulf War, when Iraq launched conventionally armed Scud missiles into Israel and Saudi Arabia, striking a U.S. barracks, causing one quarter of U.S. combat fatalities of the conflict.[54] During Desert Storm, Patriot anti-missile batteries were used with some effectiveness, with several Scuds destroyed before they reached their targets. Following the Gulf War and the election of President Clinton, the decision to develop and field national missile defense remained unresolved, and the decision was deferred to the incoming president.[55] National Security Advisor Sandy Berger stated that the reason for not fielding a national missile defense was that "the administration simply has not obtained the information that would allow us to conclude that the system is technologically feasible, operationally effective and can work reliably under realistic conditions."[56] In reality, the technological hurdles that needed to be overcome coupled with the price tag (estimated at $20 billion) were the reasons why more development was not accomplished and why the decision was deferred.[57]

Early on in his presidency, George W. Bush made it clear that he would abandon the ABM treaty and continue development of a national missile defense program. The speech quoted above was given at National Defense University was prior to the terrorist attacks on New

York and Washington D.C, and his comments were not widely reported, nor was there a public outcry to continue the work on the national missile defense program. After September 11 however, the public felt vulnerable and cried out to be protected against terrorism and the possibility that a ballistic missile with a nuclear, biological or chemical warhead could be used to kill untold numbers of innocent U.S. citizens. On 13 December 2001, President Bush formally announced that the U.S. would withdraw from the ABM treaty, citing that the threat is no longer the Soviet Union, but instead from "terrorists who strike without warning, or rogue states who seek weapons of mass destruction and would seek the ability to deliver death and destruction to our doorstep via missile." [58] On 6 June 2002, after a 6 month waiting period, the U.S. was formally released from the constraints of the ABM treaty.

Article XV of the ABM treaty states "Each party shall, in exercising its national sovereignty, have the right to withdraw from this Treaty if it decides that extraordinary events related to the subject matter of this treaty have jeopardized its supreme interests. It shall give notice of its decision to the other party six months prior to withdrawal from the treaty. Such notice shall include a statement of the extraordinary events the notifying party regards as having jeopardized its supreme interests."[59] The reason for withdrawing from the ABM treaty was that a national missile defense system would be deployed to protect against a long range missile attack on the mainland U.S. in light of the 9-11 terrorist attacks. Considering that there is no information that a terrorist organization possesses a long range ballistic missile to attack the U.S., trying to quell an uneasy public in the aftermath of the 9-11 terrorist attacks is not in the spirit of the ABM treaty withdrawal clause.

Currently, there is no peer competitor with the United States with respect to numbers of nuclear weapons, or their delivery vehicles (long range, accurate ballistic missiles) with the exception of Russia. Additionally for the foreseeable future, no peer competitor will rival the United States with respect to nuclear weapons or long range ballistic missiles. The exceptions to this are North Korea and China, who both possess long range missiles and nuclear weapons capable of reaching the continental U.S (see table below).



BALLISTIC MISSILE PROLIEFERATION- 2002

North Korea is one of the leading exporters in long range ballistic missiles, is a known proliferator and has sold missiles or missile technology to a number of countries including Egypt, Iran, Libya, Pakistan, Syria, and perhaps others.[60] Based on this fact alone, the threat seems to be increasing in that a ballistic missile *could be used* to launch an attack against the U.S. In reality, however, any current or aspiring nuclear state would be fool-hardy to launch an attack using long range missiles against the United States because the launch would be immediately detected, located, and the retaliation would no doubt be swift and overwhelming. Additionally, China and North Korea possess fewer warheads than is typically at sea on U. S. ballistic missile submarines. Also in terms of total destructive damage, the U.S. is far superior and would exact a far larger toll than any potential competitor.

NMD AND THE MOST LIKELY METHOD OF NUCLEAR WEAPON ATTACK

The U.S. intelligence community considers an attack against the United States using ballistic missiles to be highly unlikely.[61] The most likely scenario dealing with WMDs delivered against the United States would come from a smaller weapon delivered covertly into the United

States and then detonated.[62] Such a scenario could be an air delivered version on a small plane or perhaps even from a crude UAV. Ballistic missiles tend to be harder to store and move, and are less accurate than hand placing a device in its intended location. The type of nuclear weapon most likely to be employed is the "dirty bomb", which combines conventional explosives with radioactive material (which could be obtained through medical imaging devices such as X-ray machines, radiography sources, and even smoke detectors which contain Americium-242). When such a device is detonated, it would cause the radioactive material to be spread over a long distance causing significant contamination, but low general area radiation levels. Far more fatalities and casualties would result from the direct blast effects of the conventional explosives than would come from the radioactive contamination and the increase in localized radiation levels. This type of device would probably cause widespread panic by the general public, who are not aware what levels of radiation would impart on the human body, but would not constitute or lead to a major loss of life. In this most likely case of a nuclear device being used against the American population, a missile defense system would do absolutely no good to prevent it. Protection against this would require many other countermeasures such as tighter border controls, increased screening of imported cargo, etc, and not on missile defense to protect the American people.

CURRENT NMD TECHNOLOGY

The current capabilities of the NMD program have been a result of much research and development coupled with testing which has been going on since the 1980's. It is not designed to be used against Russia and China; it is designed to provide protection form the so-called "Axis of Evil" powers. To better understand the problems of NMD, it is useful to describe some basics associated with it. There are three major portions of flight where a ballistic missile can be intercepted. These are the boost, the midcourse, and the terminal phases. In the boost phase, the missile is under power by a rocket, presents a high Infra Red (IR) signature, and moves at a relatively slow speed. In this phase, it is easy for land, sea and space based sensors to detect the IR signature, but hard to engage due to short duration (only 1 to 2 minutes), limiting engagement time. Clearly, this would be an ideal location for the intercept-close to the launch site, and far from the intended target. The next phase is the midcourse where the warhead may still be rising, and its flight path is either endo- or exo-atmospheric. In this phase the timeline is extended, but the speeds are relatively high, and the warhead is more difficult to pickup from the cooler background in which it is traveling. Due to the longer timelines

associated with this phase, and the relatively long distances from its intended target, this is the optimum place where an intercept and shoot down is most favorable. In the last phase of flight, the reentry vehicle (RV) is reentering the atmosphere and heading towards its intended target. In this phase, the speeds are high, and the timeline is fairly short, so it is difficult to intercept and destroy it. Additionally, an intercept in this phase could cause the RV to continue traveling towards its intended target, causing damage from the destroyed parts. An additional consideration which must be taken into account in this phase is the relative speeds required to conduct the intercept.[63] This speed consideration is based on the range of the missile. The shorter the range of the missile, the lower the intercept speed. As a speed comparison, short range ballistic missiles (0 – 600 miles) have reentry speeds of 1-2 km/sec, medium range ballistic missiles (0 – 1300 miles) have speeds of 3-4 km/sec; intermediate range ballistic missiles (0 – 3500 miles) have speeds of 4-5 km/sec, and intercontinental ballistic missiles (5500 – 10,000 miles) have speeds of >7 km/sec. Another aspect that deserves attention is the technology to defeat a missile defense system[64]. Based solely on speed consideration, it is advantageous to intercept during boost, but since the time in this phase is short, the optimum place would be in the midcourse. As technology emerges and matures, and as open source reports about the capabilities of the missile defense system are analyzed, a competitor could very conceivably develop a system to defeat it. Currently, the United States, Russia and China have developed numerous countermeasures such as dummy reentry vehicles and decoys designed to complicate the targeting and interception of the incoming threats by overwhelming the system with large numbers of false targets severely degrading the fidelity of the system.[65] These false targets or penetration aids include "readily available technology, including separating RVs, spin-stabilized RVs, RV reorientation, radar absorbing materials (RAM), booster fragmentation, low-power jammers, chaff, and simple (balloon) decoys to develop penetration aids and countermeasures." [66] In this case, the seeker on the interceptor would have an extremely difficult time distinguishing the real RV from the decoy, and would cause the effect of having to launch more interceptors to destroy the actual RV. Currently, the missile defense system has not been tested against realistic decoys, so it is not clear how the system will react under those conditions. The published success rate as reported by the Pentagon under perfect, sterile testing conditions is about 88%. A more realistic success rate is only about 45%. [67] Also, ground based systems are easily overwhelmed and the fixed radar systems are easily targeted by a potential terrorist attack.[68] So the question becomes, why would the U.S. deploy a system that works less than half the time? Would one do that with an automobile, a computer, or a gun? Of course not, so why rush to field a system to protect the American

citizens that doesn't currently work perfectly under repeatable and controlled sterile "laboratory" conditions? The answer is simple- in most people's minds as was stated earlier following the tragic events of September 11th made the American people feel vulnerable. Therefore some defense (even against a very remote threat) is better than no defense, but as I have pointed out earlier, missile defense is not likely to solve the terrorist threat, and in fact, may cause far more complications in an already uncertain world.

THE PRICE OF PROTECTION WITH NMD

The next major issue with national missile defense is the extremely high price tag. Many people believe that any defense that will protect them against a nuclear strike is well worth the cost. This is the same problem that President Ronald Reagan had to overcome and at the time, the cost of "Star Wars" or Strategic Defense Initiative (SDI) was deemed too costly to fully develop and field. Despite the high price tag of SDI, many people viewed the build up of military forces and the technological developments of SDI essential to the downfall of the Soviet Union and protection of the American people on the mainland. Currently, we are faced with a similar situation, except this time there is no "Red Menace". The economy is not as strong, with a more fiscally constrained Congress and DOD. Social programs have taken the forefront, and after the fall of the Soviet Union, the armed forces have been de-emphasized, with their budgets drastically reduced. In the 2003 budget, $17.5 billion is allocated in FY 03 and 04 for missile defense.[69] Additionally, it is estimated that the total cost of the program could easily top $150 billion.[70] Given enough money and time, any and all technological hurdles can be overcome, and a workable system fielded, but in the words of Senators Daschle, Conrad and Levin, "it could draw money away from programs to counter other, more likely and more immediate threats we face: terrorism, attacks with anthrax or other biological and chemical agents, the proliferation of weapons of mass destruction, and delivery systems that are far more likely to be used than are ballistic missiles, such as trucks, ships, airplanes and suitcases".[71]

"The United States of America and the Union of Soviet Socialist Republics, herein referred to as the Parties,

Proceeding from the premise that nuclear war would have devastating consequences for all mankind,

Considering that effective measures to limit anti-ballistic missile systems would be a substantial factor in curbing the race in strategic offensive arms would lead to a decrease in the risk of outbreak of war involving nuclear weapons,

Declaring their intention to achieve at the earliest possible date the cessation of the nuclear arms race and to take effective measures toward reductions in strategic arms, nuclear disarmament, and general and complete disarmament,

Desiring to contribute to the relaxing of international tension and the strengthening of trust between states."

- Preamble to ABM Treaty[72]

Perhaps the biggest reason for not developing and fielding a national missile defense is the destabilizing effect it is likely to have and coupled with almost certain nuclear weapons proliferation. This could lead to an arms race of greater intensity than during the Cold War. The most vociferous opponent to a missile defense system is undoubtedly China. From their perspective "such a choice (ballistic missile defense) demonstrates arrogance accompanied by a lack of care for the worldwide repercussions from developing and deploying BMD, and flawed thinking for a focus on the least plausible threat to the United States".[73] According to a Henry L. Stimson Center Report, several Chinese officials acknowledge that a potential regional threat from the so-called "rogue states exist", but flatly rejected any possibility that Iran, Iraq, or North Korea could threaten, much less attack the United States using long range ballistic missiles.[74] The Chinese express numerous concerns about the effect that missile defense will have in their part of the world as well as worldwide. Among these are:

- Some scholars feel that advanced missile defense could encourage Taiwan to seek independence if it feels capable of thwarting a Chinese missile attack. Since Taiwan occupies a central place in Chinese policy, if the issue were resolved, China would have far less to fear from U.S. BMD.

- An increase in the Chinese nuclear arsenal would be essential since they possess a relatively small nuclear arsenal, which would be ineffective against a U.S. defensive missile system. [75]

- The domination by the U.S. may put China at a disadvantage by preventing any viable means to warn of a U.S. launch, thereby limiting their command and control capabilities.

- The possibility of a U.S. first strike which would destroy the majority of China's land-based ICBM's, with the missile defense system destroying any retaliatory strike missiles. This would leave China (and other smaller nuclear powers) open to nuclear blackmail by the U.S. From the U.S. perspective, we would never even entertain such an idea, but this can not be discounted as a valid concern by some countries.

- A possible economic collapse of the Chinese economy which would destabilize the world economic situation. If excessive resources are diverted to thwart a US missile defense either by an arsenal build up, or development of a similar system an economic catastrophe could ensue, since much of the Chinese economy is devoted to becoming a major worldwide economic power. [76]

The concerns cited above are from the Chinese perspective, but they also represent the sentiments of several other countries around the world such as North Korea, and several Middle East countries. Russia was initially skeptical about the U.S. abrogating the ABM treaty and expressed similar concerns, but accepted the decision "with regret".[77] Some other allies have also expressed a concern about global destabilization. In Canada the Foreign Minister cited that "The big red line we all have is the weaponization of space, which I believe would be immoral, illegal and a bad mistake."[78]

THEATER MISSILE DEFENSE

"Theater missiles (TMs) are ballistic missiles, cruise missiles and air to surface missiles whose targets are within a given theater of operation. Their proliferation and advances in missile and associated technologies, coupled with the pursuit of weapons of mass destruction (WMD) capabilities, can provide adversaries with potentially decisive attack capabilities. TMs may be as much a political weapon as a military weapon"

¾ **Overview from Joint Pub 3-01.5** [79]

Perhaps the biggest threat to U.S. and allies alike is the threat of attack using cruise and theater ballistic missiles, as was vividly demonstrated during the 1991 Gulf War where short-range Scud missiles were used against Israel and U.S. forces in Saudi Arabia. Threats from theater missiles include, but are not limited to direct attacks on troop formations, ships operating in littorals, logistics facilities such as ports and airfields, and terror attacks against civilian population centers.[80] Theater ballistic and cruise missiles are produced and exported by a number of countries around the world, and have become widely proliferated. In general, these missiles can be configured in a number of different warhead configurations, are generally fast (some traveling over Mach 1), and are highly mobile, using mobile transporter erector launchers. Naval and amphibious operations in littoral regions are particularly vulnerable to attack by cruise and theater missiles, since ships must maintain a fairly low speed while conducting landings or recoveries. The problem with cruise missiles and missile defense is that the newer missiles are using shaping and stealth materials while flying at an extremely low altitude, which makes the currently fielded systems useless against these. There are currently several systems already fielded which provided some protection from these types of missiles, using known and mature technology, and can be rapidly fielded. Among these are the land-based Patriot missile system, and the sea based Aegis missile system using SM-3 missiles. It should be noted however, that these systems are not perfect, but provide some level of protection. Due to their rapid deployabililty, mobility, and mature technology, they are far more useful, and represent a less stabilizing threat than a national missile defense system with it's unproven record and immature technology. These systems could be rapidly sent to an area of conflict and provide protection against the most likely threats to US and allied forces, as well as providing boost phase protection against long range ballistic missiles.

Presently, there are no proliferant states that possess the capability to strike the US with ballistic missiles, nor are there such a threat projected in the near or mid-term (however current intelligence estimates state the possibility that North Korean could be able to launch a small payload to the west coast of the U.S. by about 2005- 2010 timeframe)[81]. I do not want to give the impression that I feel that a national missile defense will not be required to provide protection of the U.S., but I believe that there are many flaws with the system that is being pushed by the Bush administration which include:

- The U.S. will be able to use conventional superiority and/or nuclear weapons to pre-empt or counter such a threat as it did for much of the Cold War.

- National Missile Defense is extremely expensive.
- National Missile Defense is a potentially destabilizing measure designed to provide a limited amount of protection against an unlikely scenario.
- There are numerous technical challenges and problems associated with the current system. An example is the lack of redundant interceptor and sensor sites, and the problems associated in a high countermeasure environment, and the lack of a boost phase kill capability.
- The U.S. has not agreed publicly to extend the missile shield to our allies (which would could lower the cost incurred by the U.S. through cost sharing, and could cause more stabilization of the world situation)

Additionally, I feel that continued development and improvement of theater missile defense is fiscally sound, technologically mature, not destabilizing, will provide protection against the most likely scenarios, has gained support from allies, and is aligned to the needs of regional U.S. military commanders. Besides using hardware alone to protect the U.S., other means should also be used to dissuade or deter the proliferation of long range missiles. Among these would be economic, or political pressure or to implement something similar to the Nunn-Lugar Cooperative Threat Reduction Act (designed to fund and oversee safe disposal of Russia's redundant strategic nuclear arsenal and prevent terrorists from obtaining its weapons) [82] and to appoint a global watchdog organization such as the U.N. to ensure long range ballistic missile proliferation is held at bay. In the future after all of the above issues have been vetted and resolved, then and only then, should a national missile defense should be fielded, with a layered system using both sea- and land-based sensors and interceptors.

DETERRING THE ROGUE OR NON STATE ACTOR

"How do you deter a non-state actor who has no return address and how do you deter or dissuade someone whose reward is in the after-life"?

¾ ADM Richard Mies, CINCSTRAT, 1999[83]

The statement above expressed by Admiral Mies was in 1999, long before the 9-11 attacks on the U.S. Clearly, the issues of terrorism and deterrence were an issue despite the fact that

the U.S. had not experienced a large scale loss of life in the homeland. Following 9-11, the public also realized that it is extremely difficult to deter a terrorist. In the latest National Security Strategy, President Bush stated *"Traditional concepts of deterrence will not work against a terrorist enemy whose avowed tactics are wanton destruction and the targeting of innocents; whose so-called soldiers seek martyrdom in death and whose most potent protection is statelessness. The overlap between states that sponsor terror and those that pursue WMD compels us to action."* [84] So, can deterrence work against a rogue state or non-state actor? I believe that it can, but not in the same way that it deterred the Soviet Union during the Cold War. As I stated earlier, nuclear weapons have a stabilizing affect when in the hands of stable governments, and are extremely destabilizing when in the hands of single individuals, non-state actors, and unstable governments.

NUCLEAR WEAPONS AND ROGUES OR TERRORISTS

Why do rogue states want nuclear weapons in the first place? Among these reasons are:

- Status and prestige and the fact that they have a "glitter factor" in a world that is often rushing to buy the latest weapons, regardless of the ability to absorb them effectively and to provide effective training and maintenance.
- The need to enhance warfighting capabilities and use the weapons as "equalizers"
- They are intimidating weapons, even if never used. They provide the perfect vehicle for blackmail.
- They are far less expensive than building up conventional forces to achieve the same end state.
- The desire to create the capability for devastating covert or asymmetric attacks by states, their proxies, or terrorist groups.
- The perceived ability to exploit an enemy's lack of effective civil and critical facility defense and anti-tactical ballistic missile detection or defense capabilities.[85]

DO TERRORISTS POSSESS NUCLEAR WEAPONS?

> **"There is little doubt in my mind that Osama bin Laden and his operatives would have used weapons of mass destruction if they possessed them. The horrible death and destruction of the September 11th tragedy was minimal compared to what could have been inflicted by a weapon of mass destruction"**
>
> —Senator Richard Lugar [86]

Is it possible for Al Qaeda to possess a nuclear weapon? At first blush, the answer would unequivocally be yes. Then why did they not use it prior to or in conjunction with the 9-11 attacks? Would they use one if they possessed one, and if they would not use it, what is stopping them? In my opinion, the answers to the above questions are: No, they do not currently possess a nuclear weapon, and yes, they would use it if they had one.

There are several differing opinions regarding whether or not a terrorist group currently possess nuclear weapons, but it is clear that they have been trying to obtain fissile nuclear materials for some time. This was noted in the federal indictment of Osama Bin Laden, which states "at various times from at least as early as 1993, Osama bin Laden and others known and unknown, made efforts to obtain the components of nuclear weapons. Similarly, a criminal complaint lodged against Mamdouh Mahmud Salim, one of Bin Laden's top lieutenants, charged that in 1993, he had approved the attempted purchase of enriched uranium for the purpose of developing nuclear weapons".[87] In February 2002, when U.S. forces engaged in Operation Enduring Freedom retrieved materials in Afghanistan they found that "The analysis of suspicious canisters, computer discs and documents conducted by the government suggests, in fact, that Mr. bin Laden and Al Qaeda may have been duped by black-market weapons swindlers selling crude containers hand-painted with skulls and crossbones and dipped, perhaps, in medical waste to fool a Geiger counter."[88] Even though it appears that all attempts for Al Qaeda to obtain nuclear weapons have been unsuccessful in the past, there is still the possibility that one day, perhaps in the near future they will find a conduit for obtaining functioning nuclear weapons. If they can not get fully functioning nuclear weapons, it seems likely that their next logical step would be obtaining fissile materials and constructing a weapon themselves. According to the International Atomic Energy Agencies (IAEA) Illicit Trafficking Database, there have been about 600 *recorded* cases of trafficking. Of these about 400 have been undertaken by states, 200 by individuals or non-state actors. 18 of these cases have

involved Highly Enriched Uranium (HEU) or plutonium, but none of the seizures have produced enough material to construct a workable nuclear fission warhead.[89] To assist in their effort, it is possible to buy books from bookstores that discuss how to construct nuclear weapons such as "The Travelers Guide to Nuclear Weapons", or find step by step details on the Internet. Overcoming some significant technical hurdles, combined with access to HEU or plutonium makes it conceivable that a nuclear weapon could someday be constructed. It is impossible to ascertain whether enough fissile material has been stolen to make a nuclear weapon, but there is enough to make a "dirty bomb" to be sure.

Additionally, the issue on everyone's mind is whether Saddam Hussein or North Korea possesses nuclear weapons and would they supply them to a terrorist organization such as Al Qaeda. I believe that the answer is a resounding NO due to the fact that if they were used, it would be impossible to hide the fact that the weapons came from Iraq or North Korea, and when this comes to light, Saddam Hussein or Kim Jong-Il would be eliminated from power.

NUCLEAR BLACKMAIL

There have been numerous movies that had as a plot line that terrorist groups would obtain nuclear weapons and use them to blackmail the United States. Movies such as "True Lies", "Crimson Tide", and "The Sum of All Fears" are examples that were out before the 9-11 terrorist attacks. Blackmail attempts have been attempted against the U.S. several times in the past, the most recent was in Boston in 2002. So far all blackmail attempts have been false, and are likely to remain so in the future. The major blackmail concern at present doesn't involve the threat of use of a nuclear weapon against the U.S., but entails the threat of proliferation of nuclear weapons by North Korea. North Korea possesses an extremely large military (more than 1 million), which would seem large enough to protect it from an attack on its soil and defend its national sovereignty. Shortly after the Korean War, sanctions were imposed on it causing a weak economy and poor living conditions among its population. Its major export is long range missiles and the technology associated with it. As early as 1993, the North Koreans started using the threat of proliferation of nuclear weapons to help ease its sanctions. Late in 2002, the North Koreans once again tried to use nuclear blackmail in the form of the threat of proliferation to achieve their ends- which I believe is to further ease the sanctions placed on them. I believe that this is a classic case of blackmail- if you don't give us what we want we will develop nuclear

weapons. For North Korea, it is almost impossible to develop enough nuclear weapons to make a power play against a major power, but they could be used as a bargaining tool. It is not clear whether or not they actually possess nuclear weapons, but it is clear they are using blackmail to get what they want. In the future blackmail using nuclear weapons will become more and more common. Attempted nuclear blackmail will continue to be countered by both deterrence by punishment and deterrence by denial. If threatened by any form of legitimate government, deterrence by punishment should work, as the government attempting blackmail will be reminded in no uncertain terms, that they will be destroyed many times over. If the blackmail comes from a non-state actor, deterrence by denial is the best method, since non-state actors have no government or population to answer to.

NUCLEAR DETERRENCE AND TERRORISTS

For a terrorist act to succeed, the group must possess motive, means, and opportunity.[90] Almost certainly many terrorist organizations possess the motive to use a nuclear device against the U.S.. Osama Bin Laden has declared "that acquiring nuclear weapons is a religious duty".[91] So if a terrorist organization possesses the motive to obtain and use a nuclear weapon, how does one stop them? Which form of nuclear deterrence will stop a terrorist organization? Can U.S. nuclear might (deterrence by punishment) stop a terrorist from detonating a nuclear weapon on U.S. soil? Admiral Mies was probably right; deterrence by punishment of a terrorist, non-state actor, or rogue state will probably not work. So if deterrence by punishment does not work, deterrence by denial should. If a center of gravity that could be exploited is removed, deterrence by denial is achieved. But the real question is how can one stop them from obtaining nuclear materials (after all, if they do not possess nuclear weapons, then they can not use them)? This undertaking would be a long term solution and would have to be taken on many levels, and involve cooperation on the part of all the nations of the world to be successful. To be sure it is not an overnight fix, but measures need to be taken to prevent a terrorist organization from obtaining nuclear weapons or materials. This is the only true way to prevent a terrorist organization from using a nuclear weapons against the U.S. homeland.

CONCLUSIONS

To prevent nuclear weapons from being used against the U.S. homeland the following measures should be taken:

- A multilateral agreement between all the nuclear powers which pledge to each other that their governments will do everything technically possible to prevent theft of weapons or fissile material and do this in the shortest possible timeframe. These actions include additional safeguarding measures and accounting processes. The Nunn-Lugar Cooperative Threat Reduction Act was an important first step between the U.S. and Russia and can serve as a model upon which to base new agreements.

- A strict arms control agenda should be agreed to that transparently destroys excess nuclear weapons to ease the strain of safeguarding them and to limit the physical footprint of nuclear weapons that require security. The warhead's HEU or plutonium should be converted into low-enriched nuclear fuel to be used for electricity in nuclear power plants. This step should be done as transparently as possible to ease fears that a country is not meeting its obligations.

- All countries that possess weapons-useable material for whatever reason (research, energy generation, etc.), must register the amount and type of material and enlist in an international effort to guarantee the security of such materials from theft by terrorist or criminal groups. It is important to note that most of this material originally came from either the U.S. or Russia, and the countries possessing it should surrender the material or agree to have it controlled. [92]

- The nuclear weapons states should agree to view the use of a nuclear device on any member state an attack on all of them, with a consolidated, measured and rapid response. This is similar to what exists with NATO (an attack on one is an attack on all). History has shown that the NATO Alliance has stabilized Europe since its inception, and there is no reason to believe that a nuclear version will not accomplish the same stabilizing affect. The response should be widely publicized ensuring that there is no ambiguity as to what the repercussions are.

- A robust intelligence effort should be undertaken to search for any fissile material which may have been stolen in the past, and this intelligence should be made available to all participating members.

- Robust command and control and warhead arming devices (such as Permissive Action Link) devices should be made available to all nuclear powers to ensure that the warhead can not be armed in the event of a loss of the weapon.

- A tamper proof transponder should be added to the warhead so in the event of theft or loss that it can be rapidly located and recovered.

- If threatened using nuclear blackmail we should alert other nuclear states of the threat and invoke the collective security agreement described above.

In summary, I believe that terrorists do not currently possess nuclear weapons that would result in a nuclear detonation, but if they did, they would use them. Efforts such as those described above, combined with existing measures such as the Nunn-Lugar Cooperative Threat Reduction Act[93], the United Nations non-proliferation treaty, and IAEA controls should help ensure that they will not acquire them either. The real key is to lock up, safeguard, and provide a rigorous accounting for all worldwide fissile material, which is the most probable route for terrorist organizations to get nuclear weapons or fissile material.

Nuclear weapons have a stabilizing affect when in the hands of stable governments, and are extremely destabilizing when in the hands of single individuals, non-state actors, and unstable governments. Recent events in the world following the collapse of the Soviet Union, and the emergence of numerous terrorist groups, non-state actors, and rogue states have ensured that regional instability and the threats to the U.S. are at an all time high. Additionally, due to increased proliferation of missile technology and fissile materials, the U.S. will need to maintain nuclear weapons and use nuclear deterrence to protect its sovereignty and the sovereignty of its allies.

WORD COUNT = 11,548

ENDNOTES

[1] Randall Mikkelsen, "U.S. Sees Nuclear Deterrence Against WMD Attack", 10 December 2002; available from http://www.nytimes.com/reuters/politics/politics-bush-security.html; Internet; accessed 10 December 2002.

[2] George W Bush, The National Security Strategy of the United States of America (Washington D.C.: The White House, September 2002), 15.

[3] V. N Mikhailov, "Nuclear Disarmament, Nonproliferation and National Security", 2001; available from http://www.ceip.org/files/projects/npp/pdf/Mikhailov%20Book/MikhailovBook1.pdf; Internet; accessed 7 December 2002.

[4] American Heritage on-line Dictionary; available from www.education.yahoo.com/reference/dictionary/entries/14/d0171400.html; Internet; accessed 12 January 2002. The search was conducted using the keyword 'deterrence'.

[5] David M Kunsman and Douglas B. Lawson, A Primer on U.S. Strategic Nuclear Policy (Sandia National Laboratories, 2001), 9.

[6] Keith B Payne, Rationale and Requirements for U.S. Nuclear Forces and Arms Control (Fairfax, VA.: National Institute for Public Policy, January 2001), 26-28.

[7] Max G. Manwaring, Deterrence in the 21st Century (London, England: Frank Cass and Company limited, 2001), 109-116.

[8] Ibid., 116-117

[9] "Nuclear Posture Review Excerpts", 8 January 2002; available from HTTP://www.globalsecurity.org/wmd/library/policy/dod/npr.htm; Internet; accessed 30 August 2002.

[10] Ronald Reagan, National Security Decision Directive Number 32 (Washington, D.C.: The White House, 20 May 1982), 5.

[11] John F. Kennedy, "Inaugural Address"; 20 January1961; available from www.yale.edu/lawwweb/avalon/presiden/inaug/kennedy.htm; Internet; accessed 12 Jan 2003.

[12] "Nuclear Weapons Status 2002", 2002; available from http://www.ceip.org/files/nonprolif/map/default.asp; Internet; accessed 15 October 2002.

[13] Stephen M. Younger, Nuclear Weapons in the Twenty-First Century (Los Alamos, NM.: Los Alamos National Laboratory, 2001), p 4.

In his paper Dr. Younger examines current trends with nuclear weapons and the countries that have them. He states: The end of the Cold War, the evolution of new regional threats to international security, and the stated desire of many countries to reduce or eliminate their nuclear arsenals suggest that the time is right for a fundamental rethinking of the role of nuclear weapons in national security. Nuclear weapons, as the most destructive instruments yet invented, must be considered as part of a coordinated national security program that employs diplomacy, arms control initiatives, and conventional forces to optimize stability and peace in the world.

Technology assessments suggest that advanced conventional weapons delivered by ballistic or cruise missiles could defeat many targets that are presently targeted by nuclear weapons. Precision delivery of nuclear weapons would enable some classes of hard targets to be defeated with much lower yields than are currently employed. Some number of current nuclear weapons designs might be retained in order to address very hard targets or for traditional deterrent roles. Simple, rugged nuclear weapons designs that might be maintained at relatively low cost and without the need for nuclear testing might be a part of such a strategy.

Nuclear weapons cannot be uninvented. Nor can we assume that their role in strategic deterrence will never change. Prudent thought given to the role of nuclear weapons in the

twenty-first century will reap handsome dividends for the national security of the United States and for the stability of the whole world.

[14] Robert S. Norris,. “Israeli Nuclear Forces 2002”, Bulletin of the Atomic Scientists 58 (September/October 2002): 73-75

[15] The Official position from the British Ministry of Defense states “The Government wishes to see a safer world in which there is no place for nuclear weapons. To help make the world a safer place the Government is pressing for multilateral negotiations towards mutual, balanced and verifiable reductions in nuclear weapons, but of course we are not there yet. That is why we need to maintain our nuclear deterrent as the ultimate guarantee of our security. When we are satisfied with progress towards our goal of the global elimination of nuclear weapons, we will ensure that British nuclear weapons are included in negotiations.”.

France states “Nuclear deterrence will stay a fundamental capability, as far as the major strategic balances are threatened throughout the world, mainly by proliferation of weapons of mass destruction.” In April 2000 Vladimir Putin published Russia’s Military Doctrine which stated “Under present-day conditions the Russian Federation proceeds on the basis of the need to have a nuclear potential capable of guaranteeing a set level of damage to any aggressor (state or coalition of states) under any circumstances.

The nuclear weapons with which the Russian Federation Armed Forces are equipped are seen by the Russian Federation as a factor in deterring aggression, safeguarding the military security of the Russian Federation and its allies, and maintaining international stability and peace. In their National Security Strategy they state: ”The Russian Federation reserves the right to use nuclear weapons in response to the use of nuclear and other types of weapons of mass destruction against it and (or) its allies, as well as in response to large-scale aggression utilizing conventional weapons in situations critical to the national security of the Russian Federation.

The Russian Federation will not use nuclear weapons against states party to the Nonproliferation Treaty that do not possess nuclear weapons except in the event of an attack on the Russian Federation, the Russian Federation Armed Forces or other troops, its allies, or a state to which it has security commitments that is carried out or supported by a state without nuclear weapons jointly or in the context of allied commitments with a state with nuclear weapons."

In China's White Paper on National Defense they state: "Strategically China pursues the defensive policy featuring self-defense and gaining mastery by striking only after the enemy has struck, and adheres to the principle: "we will not attack unless we are attacked; if we are attacked, we will certainly counter-attack." China possesses a small number of nuclear weapons, entirely for meeting the needs of self-defense."

Finally, in the NATO handbook they state" The Strategic Concept also stipulates that the Alliance will maintain for the foreseeable future an appropriate mix of nuclear and conventional forces based in Europe, kept up to date where necessary, at the minimum sufficient level.

[16] Avery Goldstein, Deterrence and Security in the 21st century- China, Britain, France and the Enduring Legacy of the Nuclear Revolution (Stanford, CA.: Stanford University Press, 2000), 226-227.

[17] "What do you know about nuclear Deterrence"; available from http://www.mod.uk/aboutus/factfiles/nuclear.htm; Internet; accessed 15 Dec 2002.

[18] George W. Bush, The National Security Strategy of the United States of America, 1 – 31.

[19] "Fact Sheet: Treaty on Strategic Offensive Reductions - Moscow Treaty on Strategic Offensive Reductions"; available from http://www.whitehouse.gov/news/releases/2002/05/20020524-23.html; Internet; accessed 30 August 2002.

[20] "The Morality of Nuclear Deterrence", June 1998; available from www.ccnr.org/pax_christi.html ; Internet; accessed 22 September 2002. This decree was signed by 75 U.S. bishops, and calls for complete nuclear disarmament based on moral reasons.

[21] "Statement on Nuclear Weapons by International Civilian Leaders", 2 February 1998; available from www.ccnr.org/civilian_leaders.html;Internet; Accessed 22 September 2002. This statement was signed by 99 former presidents and prime ministers, including Jimmy Carter, Mikhail Gorbachev, and Bishop Desmond Tutu. This statement calls for complete worldwide disarmament citing that the world would be more secure and any use of nuclear weapons would be immoral.

[22] "Canberra Commission on the Elimination of Nuclear Weapons: Executive Summary", August 1996; available from http://www.nuclearfiles.org/docs/1996/960814-canberra-statement.html; Internet; accessed 22 September 2002. The Commission was made up of former military and civilian leaders of several countries. Among these were General (Ret) Butler (former STRATCOM Commander, and Robert McNamara (Secretary of Defense under Presidents Kennedy and Johnson). They stated: "The possession of nuclear weapons by any state is a constant stimulus to other states to acquire them. The world faces threats of nuclear proliferation and nuclear terrorism. These threats are growing. They must be removed.

For these reasons, a central reality is that nuclear weapons diminish the security of all states. Indeed, states which possess them become themselves targets of nuclear weapons. The opportunity now exists, perhaps without precedent or recurrence, to make a new and clear choice to enable the world to conduct its affairs without nuclear weapons and in accordance with the principles of the Charter of the United Nations."

[23] John Burroughs, "Undermining Nuclear Security Agreements", August 2002; available from http://www.ieer.org/sdafiles/vol_10/sda10-4.pdf; Internet; accessed 30 October 2002

[24] The Treaty on the Non-Proliferation of Nuclear Weapons (NPT), (New York, NY.: United Nations, 11 May 1995), Article 6.

[25] David Krieger, "Why Fight For a World Free of Nuclear Weapons?"; 2002; available from www.wagingpeace.org/articles/02.02/0228kriegerwhyfight.htm; Internet; accessed 22 September 2002.

[26] International Court of Justice, "Legality of the Use by a state of Nuclear Weapons in Armed Conflict", 8 July 1996; available from http://www.nuclearfiles.org/redocuments/1996/960708-icj-who1.html; Internet; accessed 24 September 2002.

[27] Michele Flournoy and Clark A. Murdock, Revitalizing the U.S. Nuclear Deterrent, (Washington, D.C.: Center for Strategic and International Studies, 2001), 87-95.

[28] John P. Holdren, The Future of U.S. Nuclear Weapons Policy (Washington, D.C.: National Academy of Sciences, 1997), 85 – 86.

[29] Keith B. Payne, Rationale and Requirements for U.S. Nuclear Forces and Arms Control (Fairfax, VA: National Institute for Public Policy. January 2001), 3 - 4

[30] Ibid., 5.

[31] "Nuclear Posture Review Excerpts", 8 January 2002; available from HTTP://www.globalsecurity.org/wmd/library/policy/dod/npr.htm; Internet; accessed 30 August 2002.

[32] Ibid.

[33] Robert S. Dudney and Peter Grier, “Bush’s Nuclear Blueprint”, March 2002; available from http://www.afa.org/magazine/march2002/0302nuke_print.html; Internet; accessed 24 September 2002.

[34] Michele Flournoy and Clark A. Murdock, Revitalizing the U.S. Nuclear Deterrent, 102-126.

[35] Ivo H. Daalder and James M. Lindsay, “One-Day Wonder; The Dangerous Absurdity of the Bush-Putin Arms Treaty”, 26 August 26 2002; available from http://www.prospect.org/print/V13/15/daalder-i.html; Internet; accessed 1 December 2002.

[36] Ibid.

[37] Evan S. Medeiros, “The U.S. Nuclear Posture Review and China’s Responses”, 1 April 2002; available from http://www.cns.miis.edu/pubs/week/020401.htm;Internet; accessed 2 October 2002.

[38] “3 Nobel Laureates Criticize Bush Nuclear Posture Review”; Available from http://www.clw.org/control/nprnobels.html,Internet, Accessed 2 October 2002.

[39] Michele A. Flournoy, QDR 2001- Strategy-Driven Choices for America’s Security (Washington, D.C.: National Defense University Press, 2001), 334-336.

[40] Ivo H. Daalder and James M. Lindsay, “A New Agenda for Nuclear Weapons: On Nuclear Weapons, Destroy and Codify”, February 2002; available from www.brook.edu/comm/policybriefs/pb94.htm; Internet; accessed 7 October 2002.

[41] Ibid.

[42] Ibid.

[43] Max G. Manwaring, Deterrence in the 21st Century (London, England, Frank Cass and Company Limited, 2001), 44 – 46.

[44] Ibid., 47.

[45] Ibid. 47.

[46] Ibid. 48.

[47] "Conference on the Limitation of Armament", 6 February 1922; available from http://www.ibiblio.org/pha/pre-war/1922/nav_lim.html; Internet; accessed 7 February 2003.

[48] Nikolai Sokov, "Tactical Nuclear Weapons (TNWs)", May 2002; available from http://www.nti.org/e_research/e3_10b.html; Internet; Accessed 13 Jan 2003.

[49] The following table summarizes the approximate numbers of TNWs, total numbers of weapons, and percentage of the arsenal that are TNWs:

Country	TNWs	Total Weapons	TNW percentage
Russia	~6,000-13,000	~20,000	30-65 %
The United States	~1,670-4,700	10,700	15-43%
China	~400	410	97%
Israel	~200	~200	100%
France	60-80	348	17-23%
India	~60	90	66%
Pakistan	15-48	50	30-99%
Great Britain	0	185	0%

Data Sources: the Center for Non-proliferations Studies, Carnegie Endowment for International Peace, Center for Defense Information

[50] George W. H. Bush, "Address to the Nation on Reducing United States and Soviet Nuclear Weapons", 27 September 1991; available from: http://bushlibrary.tamu.edu/papers/1991/91092704.html; Internet; accessed 14 January 2003.

[51] Nikolai Sokov, Tactical Nuclear Weapons (TNWs), May 2002.

[52] "Nuclear Posture Review Excerpts", 8 January 2002; available from HTTP://www.globalsecurity.org/wmd/library/policy/dod/npr.htm; Internet; accessed 30 August 2002.

[53] George W. Bush, Address to National Defense University, 1 May 2001; Available from www.whitehouse.gov/news/releases/2001/05/20010501-10.html; Internet; accessed 30 September 2002.

[54] Robert Joseph and Keith Payne, "Ballistic Missile Defense- The Need for a National Debate", July 1995; available from www.ndu.edu/inss/strforum/forum37.html; Internet; accessed 18 December 2002.

[55] Sandy Berger, "Press Briefing on Clinton's NMD Decision", 1 September 2001; available from www.useu.be/ISSUES/berg0901.html; Internet; accessed 27 December 2001.

[56] Ibid.

[57] Dan Verton, "Clinton Passes on NMD Decision", 1 September 2000; available from www.fcw.com/fcw/articles/2000/0828/web-**nmd**-09-01-00.asp; Internet; accessed 27 December 2002.

[58] George W. Bush, "Announcement of Withdrawal from the ABM Treaty", 13 December 2001; Available from www.whitehouse.gov/news/releases/2001/12/print/20011213-2.html; Internet; accessed 19 December 2002.

[59] The Treaty Between the United States of America and the Union of Soviet Socialist Republics on the Limitation of Anti-Ballistic Missile Systems; (New York, NY.: United Nations, 26 May 1972), Article XV.

[60] Joseph Cirncoine and Jon B. Wolfsthal, Deadly Arsenals: Tracking Weapons of Mass Destruction (Washington, D.C.: Brookings Institution Press, June 2002), 83-99.

[61] Senator Carl Levin, "National Missile Defense"; available from http://www.levin.senate.gov/issues/missile.html; Internet; accessed 19 December 2002.

[62] Ibid.

[63] David R Tanks, National Missile Defense: Policy Issues and Technological Capabilities (Washington, D.C.: Institute for Foreign Policy Analysis, July 2000), 3.1 – 3.31

[64] Ronald T. Kadish, "Briefing on Missile Defense"; 25 June 2002; available from http://www.dod.gov/news/Jun2002/t06252002_t0625kadish.html; Internet; accessed 28 October 2002

[65] Senator Carl Levin, "National Missile Defense".

[66] Robert D. Walpole, "Statement for the Record to the Senate Subcommittee on International Security, Proliferation, and Federal Services on The Ballistic Missile Threat to the United States", 9 February 2000; Available from www.cia.gov/cia/public_affairs/speeches/archives/2000/nio_speech_020900.html; accessed 8 February 2003, 8.

[67] Kadish "Briefing on Missile Defense".

Briefing slide 10 documents the system success since 1983. The reported average on the slide is 88%, however this does not take into account failures with the launch system, sensors, etc. From the chart there have been 22 hits and 19 misses or failures for a true success rate of only 46%.

[68] Joseph Cirincione, A Brief History of Ballistic Missile Defense, 4 July 1998; available from www.ceip.org/files/Publications/BriefHistoryofBMD.asp?p=8; Internet; accessed 10 January 2003, 2.

[69] Jay Bookman, “Anti-Missile System Just Costly Fantasy”, 19 December 2002; available from www.ebird.dtic.mil/Sec2002/s20021220141537.html; Internet; accessed 20 December 2002.

[70] Carl Levin. Statement by Senators Daschle, Conrad and Levin on the New CBO Report Showing that National Missile Defense Could Cost Over $ 150 Billion, 31 January 2002; Available from www.senate.gov/~levin/releases/013102pr1.htm; Internet; Accessed 27 December 2002.

[71] Ibid.

[72] The Treaty Between the United States of America and the Union of Soviet Socialist Republics on the Limitation of Anti-Ballistic Missile Systems (New York, NY.: United Nations, 26 May 1972), Preamble to treaty.

[73] Tom Sanderson, “Chinese Perspectives on US Ballistic Missile Defense- A Report on the Stimson Center Fellowship in China”, 2001; available from http://www.stimson.org/inchina/pdf/sandersonreport.pdf; Internet; accessed 10 November 2002, 3.

[74] Ibid., 4 - 8

[75] Ibid., 4-8

[76] Ibid., 10-12

[77] Michael Wines, “Moscow Miffed Over Missile Shield But Others Merely Shrug”, 19 December 2002; available from www.ebird.dtic.mil/Dec2002/e20021219141376.html; Internet; accessed 19 December 2002.

[78] Ibid.

[79] Chairman, Joint Chiefs of Staff, Doctrine for Joint Theater Missile Defense, Joint Pub 3-01.5 (Washington, D.C.: Chairman, Joint Chiefs of Staff, 22 February 1996.), vii .

[80] Ibid., viii.

[81] Robert D. Walpole, "Statement for the Record to the Senate Subcommittee on International Security, Proliferation, and Federal Services on The Ballistic Missile Threat to the United States", 9 February 2000; available from www.cia.gov/cia/public_affairs/speeches/archives/2000/nio_speech_020900.html; accessed 8 February 2003.

[82] Simon Tisdale, "Missiles R Us takes on the World", 21 November 2002; available from www.guardian.co.uk/Print/0,3858,4551075,00.html; Internet; accessed 18 December 2002.

[83] David M. Kunsman and Douglas B. Lawson, A Primer on U.S. Strategic Nuclear Policy (Albuquerque, NM.: Sandia National Laboratories, 2001), 73.

This question was posed during a 2 day U.S. Army War College symposium to examine the current deterrence policy, and stimulate new thinking on what it would and should look like in the 21st century. The symposium was attended by more than 70 national security practitioners, ambassadors, retired and active duty military officers, congressional aids, and academicians from the United States, Europe, Latin America, and the Middle East.

[84] George W. Bush, The National Security Strategy of the United States of America (Washington D.C.: The White House, September 2002), 15.

[85] Anthony H. Cordesman, "The Evolving Threat From Weapons of Mass Destruction In The Middle East", U.S. Foreign Policy Agenda July 2002 [journal on-line]; available from http://usinfo.state.gov/journals/itps/0702/ijpe/ijpe0702.htm; Internet; accessed 10 December 2002, 39-40.

[86] Richard Lugar, “The U.S.- Russian Front Against Terrorism and Weapons Proliferation”, U.S. Foreign Policy Agenda July 2002 [journal on-line]; available from http://usinfo.state.gov/journals/itps/0702/ijpe/ijpe0702.htm; Internet; accessed 10 December 2002, 27.

[87] Matthew Bunn, “The Demand for Black Market Fissile Material”, 6 November 2001; available from www.ceip.org/files/nonprolif/templates/article.asp?NewsID=1731; Internet; accessed 21 October 2001.

[88] Thom Shanker, “U.S. Analysts Find No Sign bin Laden Had nuclear Arms”, 26 February 2002; available from http://www.nytimes.com/2002/02/26/international/asia/26NUKE.html?todaysheadlines=&pagewanted=print; Internet; accessed 7 December 2002.

[89] “International Nuclear Terrorism”, 19 Nov 2001; available from www.ciaonet.org/pbei/oxan/oxa11192001.html; Internet; accessed 19 December 2002.

[90] Graham Allison and Andrei Kokoshin, “The New Containment- An Alliance Against Nuclear Terrorism”, National Interest 69 (Fall 2002), 35-43

[91] Ibid., 37

[92] Ibid., 42-43

[93] Soviet Nuclear Threat Reduction Act of 1991, H.R. 3807, 102nd Cong., 1st sess., 19 November 1991, Sections 201 – 232.

The bill states:

(1) that Soviet President Gorbachev has requested Western help in dismantling nuclear weapons, and President Bush has proposed United States cooperation on the storage, transportation, dismantling, and destruction of Soviet nuclear weapons;

(2) that the profound changes underway in the Soviet Union pose three types of danger to nuclear safety and stability, as follows: (A) ultimate disposition of nuclear weapons among the Soviet Union, its republics, and any successor entities that is not conducive to weapons safety or to international stability; (B) seizure, theft, sale, or use of nuclear weapons or components; and (C) transfers of weapons, weapons components, or weapons know-how outside of the territory of the Soviet Union, its republics, and any successor entities, that contribute to worldwide proliferation; and

(3) that it is in the national security interests of the United States (A) to facilitate on a priority basis the transportation, storage, safeguarding, and destruction of nuclear and other weapons in the Soviet Union, its republics, and any successor entities, (B) to assist in the prevention of weapons proliferation.

In Summary the original bill along with its amendments had 5 main objectives:

- Warhead removal from the Soviet Successors to Russia (completed in 1996)
- Destruction and dismantlement of weapons systems
- Chain of custody projects
- Chemical weapons destruction assistance
- Demilitarization support.

A good overall discussion and description of the Nunn-Lugar Cooperative Threat Reduction (CTR) program can be found on the Internet at:
www.nti.org/db/nisprofs/russia/forasst/nunn_lug/overview.htm

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